CASE REPORT

Glomus tympanicum

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Abstract

Glomus tympanicum is a tumour classified under the group glomus tumours, and is also known as paragangliomas. It is thought to commonly occur in women in the fifth to sixth decades of life. Here, we report a case of a 77-year-old lady with multiple co-morbids and a diagnosis of glomus tympanicum presenting to us. Her symptoms included pulsatile tinnitus, and reduced hearing, and the management of the case was done with consideration for her underlying multiple co-morbidities. This paper also describes the best modality of treatment for this patient with regard to her background history. The treatment goal was to improve her quality of life and control the disease.

Introduction:

Glomus tympanicum is a type of tumour, which is classified under the large group of glomus tumours. Glomus tumours are also known as paragangliomas, which may occur at any site in the body, including the carotid bodies. Glomus tympanicum is a paraganglioma of the middle ear which is highly vascular and a type of benign tumour. It arises from the paraganglia of the middle ear. It is the most common primary neoplasm of the middle ear, and the second most common tumour of the temporal bone.[1]

The common presentations of this tumour are pulsatile tinnitus, due to its highly vascular nature, and conductive hearing loss due to the presence of a mass in the middle ear which impedes the passage of sound waves through the tympanic membrane (TM).[1] Large glomus tympanicum tumours may also cause vertigo, facial palsy, and even sensory neural hearing loss. [2,3,4]

Glomus tumours, interestingly, in rare cases, also produce hormones, such as adrenalin, causing rapid heartbeat, headaches, flushing, sweating, and diarrhea. These symptoms may mimic symptoms of hyperthyroidism and can lead to confusion in diagnosis, which may be cleared up with blood investigations. Small tumours may not be symptomatic and are usually an incidental finding, presenting as a reddish mass under the TM.

Hence, in a patient with an unidentifiable cause of sympathetic activity, presenting to a primary health provider, one of the differentials could be a glomus tympanicum, although rare.

Upon examination, this tumour may be visualized via a microscope or an oto-endoscope, and is, in view of its highly vascular nature, seen as a reddish mass behind the TM. Imaging studies include computerised tomography Scans (CT scans), magnetic resonance imaging (MRI), and magnetic resonance angiography (MRA).

There are three treatment options for this condition: observation, surgical excision, and radiotherapy. If observation is opted for, then the patient is ideally followed up for a hearing assessment and vertiginous symptoms. In an ideal situation, regular CT scanning is helpful in monitoring tumour progression. This type of tumour is slow growing, occurs at the weak areas within the temporal bone, and very rarely has a malignant transformation.

On the other hand, if surgical excision is preferred, a trans-canal approach to mastoid and petrous surgeries is done based on the location, extension, and structure involved in the disease process.

There are other alternative treatments, such as radiotherapy, which stops tumour growth and is preferred when treating elderly patients.

Early otolaryngology referral is important to adequately manage patients with glomus tympanicum.

Case summary

A 77-year-old housewife, an independent Malay lady with underlying ischaemic heart disease (with previous stenting), hypertension, hyperlipidemia, and knee osteoarthritis

presented to us with a history of dizziness of 4 years duration that had been increasing in intensity. She claimed that it was more of a spinning type of sensation and not related to postural changes. It was episodic and each episode lasted for about a day. She was forced to lie in bed and was unable to perform her daily activities, during these dizzy spells. There was also history of nausea and vomiting when the dizziness was severe.

There was also a history of pulsatile tinnitus, but no history of ear discharge. ear pain, or any other ear symptoms. However, there were occasional nasal symptoms. There were no throat or laryngeal symptoms.

On examination, the patient was well and comfortable. Systemic examination of the patient was unremarkable. We proceeded with a nasal endoscopy, which showed no enlarged turbinates and no mass at the nasopharynx. Oral cavity examination was also unremarkable.

There were no symptoms of rapid heartbeat, headaches, flushing, sweating, or diarrhea.

On examination, the left ear was unremarkable (**Figure 1**). On the right ear, a reddish mass is seen in the right ear with a bulging TM, which was pulsatile (**Figure 2**). No ear discharge seen, and the TM otherwise appeared healthy. The external auditory canal appeared normal.

Pure tone audiometry revealed a conductive hearing loss pattern on the right (**Figure 3**).

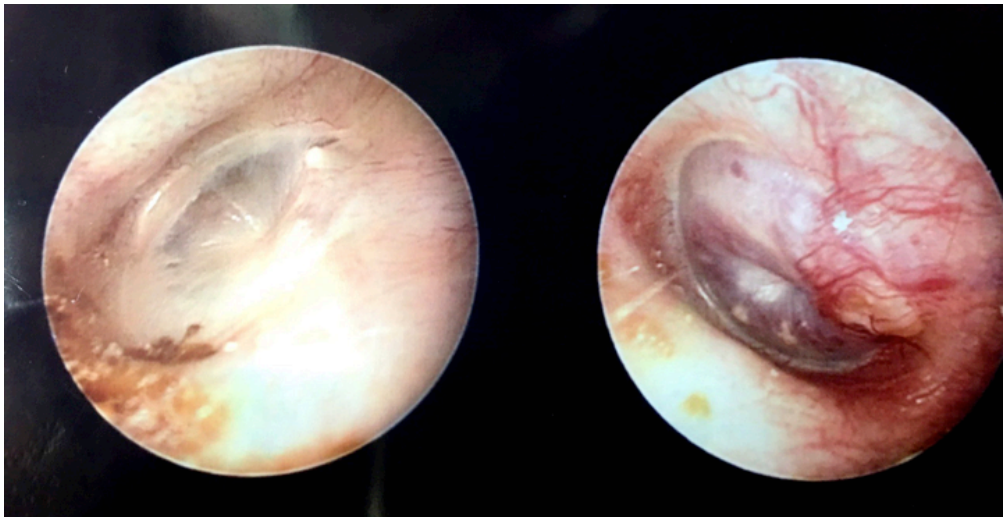

Figure 1 **Figure 2**

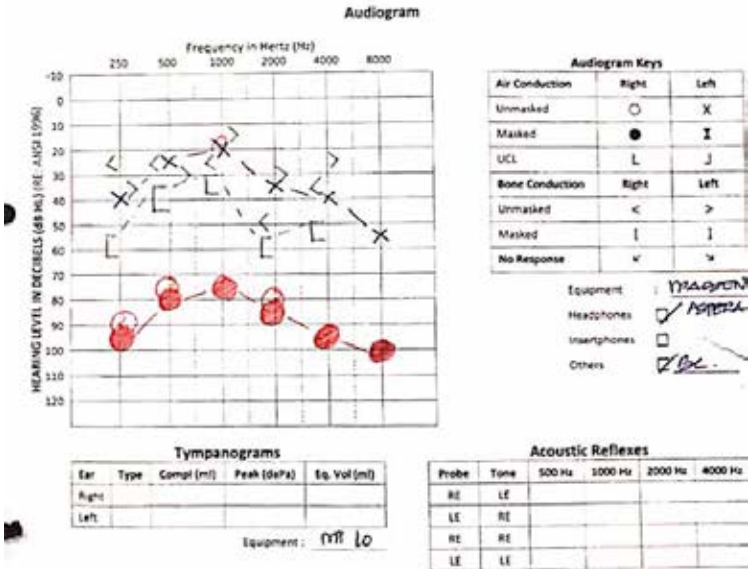

Figure 3: Audiogram showing mild to moderate sensory neural hearing loss and severe conductive hearing loss in the right ear, and mild to moderate hearing loss in the left ear.

The patient was then sent for a high-resolution computerized tomography scan (HRCT Scan) of the right temporal bone, which showed a soft tissue density occupying the mesotympanum and hypotympanum of the right middle ear. There was fluid in the epitympanic recess extending to the aditus, antrum, and mastoid air cells (**Figures 4 and 5**).

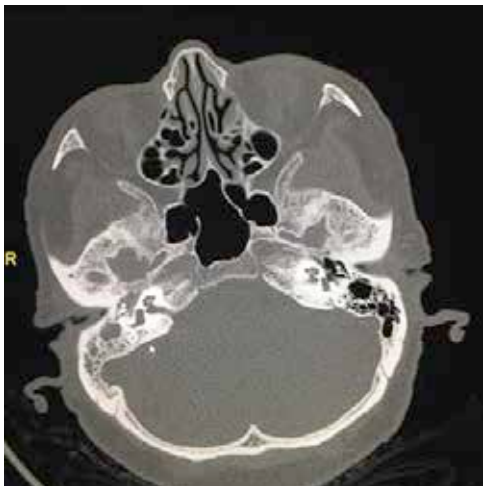

Figure 4

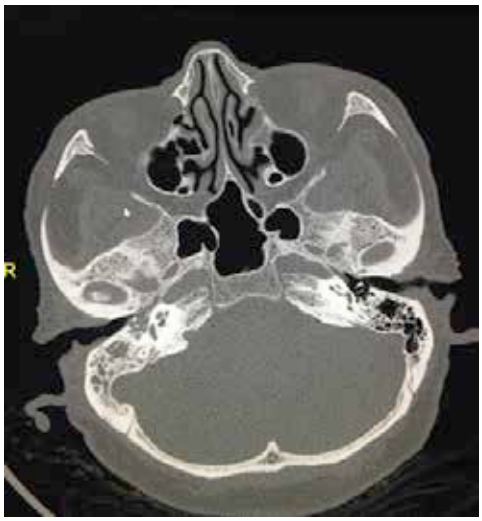

Figure 5

Figures 4 & 5 CT scans showing the middle ear on the right side occupied by soft tissue, and the right temporal bone filled with fluid, respectively.

The facial nerve canal, external ear canal, cochlea, and semi-circular canals were intact. Concerning the soft tissue in the middle ear, there was a minimally enhanced soft tissue mass abutting the right jugular bulb measuring 1x1x1.3 cm with a poor plane with the right internal jugular vein and internal carotid artery. Subsequently, an MRI was planned. Unfortunately, in view of the patient's previous history of cardiac stenting, an MRI was contraindicated, and repeat CT scans were suggested instead. The repeat CT scans showed a similar disease process, and the patient was then subjected to radiotherapy by the oncology team, due to the multiple co-morbids making her unfit for surgery.

The patient was subjected to conventional standard radiotherapy of 4000 cGy to the affected site. The observational strategy was not the preferred mode of treatment in this case, as the patient was keen on radiotherapy, and observational management is usually reserved for patients not wanting any intervention.

On follow up of the patient, she was coping well with no worsening symptoms, and the mass was seen as reducing in size.

Discussion

Glomus tympanicum commonly develops in the 5th to 6th decades of life, but, in our case, it was diagnosed in the 8th decade. The possible explanation is the slow-growing nature of this type of tumour, which probably started growing during the 5th or 6th decade, and remained asymptomatic until the 8th decade. Physical examination is important in demonstrating the retrotympanic mass as it is an important sign to be elicited to make the diagnosis. It could even be said to be pathognomonic to this condition, i.e., a reddish, pulsatile retrotympanic mass.

Based on clinical observation, glomus tympanicum is said to be most commonly presenting in the right ear, as in our patient, which is probably due to the jugular bulb on the right side being more elevated and dilated. However, this is an observation and hypothesis, and further research and association is required to prove this. Symptoms of facial nerve involvement may also be present, depending on the disease process. With tumours passing the fallopian canal on jugular foramen, auditory tube, carotid canal, and sigmoid sinus, they produce symptoms differently.[5]

There are multiple modalities of treatment for glomus tympanicum. Glomus tympanicum is usually diagnosed around the sixth or seventh decade of life, can be monitored by imaging only, and may not need surgical intervention.

Other modalities of treatment are medical treatment, which includes control of catecholamines by alpha blockers and

betablockers. With reference to our case, we did not start the patient on any alpha or beta blockers, as she was asymptomatic of sympathetic hyperactivity, although she had a background history of hypertension, diabetes mellitus, and ischaemic heart disease. These symptoms, even if present, would have been masked by the medications taken by the patient, as the patient patient was taking high doses of anti-hypertensives and hypoglycemic agents.

Alpha-blockers and beta-blockers are also usually administered for 2-3 weeks before embolization and surgery to avoid potential high blood pressure fluctuation and arrhythmias.

With regards to glomus tympanicum, the preferred treatment modality is surgical excision of the tumour. Nevertheless, advancements in radio-nuclear medicine, radiation therapy, particularly gamma knife radiosurgery, has been shown to provide promising results with good tumour growth control and low risk of treatment-related cranial nerve injury.[6]

A retrospective study was conducted to analyse the outcome of patients with glomus tympanicum after a partial resection, which showed promising results with good control of the disease and improvement in tinnitus and neurological status.[7] Based on this study, the treatment modality has deviated from conventional surgery as the preferred treatment.

Due to the location of the tumour, resection of this tumour can be a very challenging process and is further complicated due to its abundant vascularity. Preoperative embolization can also be done for these tumours to reduce bleeding complications.[8] Thus, with the advancement of radionuclear medicine and the gamma knife, we preferred this modality of treatment for our patient due to her multiple co-morbid background. We also selected this modality of treatment in view of the life expectancy of this patient.

Incisional biopsy is contraindicated in this tumour due to the highly vascular nature of the tumour, which will lead to bleeding complications. Tissue diagnosis is necessary to differentiate this tumour from others, thus an alternative is surgical resection and histopathological examination.

Conclusion

With reference to our case, it is important to tailor the management of glomus tympanicum based on the patient's co-morbidity. The treating physician should also be aware of such a diagnosis, and probing should not be attempted as it could cause a disastrous bleeding event. Physicians should also be open to other modalities of treatment, including use of the gamma knife and radiotherapy, which has shown promising results. It is important to consider the proper approach to and planning of treatment for this disease. When unsure of the diagnosis, a referral should be made to the nearest hospital with otorhinolaryngology facilities.

Hence, in any patient presenting with tinnitus, reduced hearing, and vertigo, an otoscopic examination is mandatory during a clinical office examination by all treating physicians.

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